

What is claimed is:

1. A liquid crystal display device, comprising:

a first substrate and a second substrate processed for vertical alignment;

5 a liquid crystal having a negative dielectric constant anisotropy and being sandwiched between the first and second substrates;

a plurality of color filters on the first substrate, each of the color filters having at least a first depression formed therein;

10 a common electrode on the color filters, the common electrode having a plurality of second depressions corresponding to the first depressions of the color filters; and

15 a dielectric material filled into the second depressions of the common electrode, the dielectric material having a dielectric constant smaller than the dielectric constant of the liquid crystal.

2. The liquid crystal display device as claimed in claim 1, wherein the filled second depressions have a substantially flat surface level with the surface of the first substrate.

3. The liquid crystal display device as claimed in claim 2, further comprising photodefined spacers disposed between the first and second substrates for defining the gap between the two substrates, and the dielectric material is the same as the material of the photodefined spacers.

4. The liquid crystal display device as claimed in claim 1, wherein the dielectric material forms protrusions corresponding to the second depressions.

20 5. The liquid crystal display device as claimed in claim 4, further comprising photodefined spacers disposed between the first and second substrates for defining the gap between the two substrates, and the dielectric material is the same as the material of the photodefined spacers.

6. The liquid crystal display device as claimed in claim 1, further comprising a vertical alignment film formed on each substrate, and the second depressions are filled up with the material of the vertical alignment film formed on the first substrate.

25 7. A liquid crystal display device comprising:

a first substrate and a second substrate processed for vertical alignment;

a liquid crystal having a negative dielectric constant anisotropy and being sandwiched between the first and second substrates;

a plurality of color filters on the first substrate, each of the color filters having at least a first depression formed therein, each of the first depressions extending in a direction, the first depressions being arranged in parallel to one another with a predetermined pitch among them;

5 a common electrode on the color filter layer, the common electrode having a plurality of second depressions corresponding to the first depressions of the color filter layer;

a dielectric material filled into the second depressions of the common electrode, the dielectric material having a dielectric constant smaller than the dielectric constant of the liquid crystal; and

10 an array of protrusions or slits provided on the second substrate, each extending in the direction, the protrusions, depressions or slits being arranged in parallel to one another with the predetermined pitch among them.

8. The liquid crystal display device as claimed in claim 7, wherein the filled second depressions have a substantially flat surface level with the surface of the first substrate.

9. The liquid crystal display device as claimed in claim 8, further comprising photodefined spacers are formed between the first and second substrates for defining the gap between the two substrates, and the dielectric material is the same as the material of the photodefined spacers.

10. The liquid crystal display device as claimed in claim 7, wherein the dielectric material forms protrusions corresponding to the second depressions.

20 11. The liquid crystal display device as claimed in claim 10, further comprising photodefined spacers are formed between the first and second substrates for defining the gap between the two substrates, and the dielectric material is the same as the material of the photodefined spacers.

12. The liquid crystal display device as claimed in claim 7, further comprising a vertical alignment film is formed on each substrate, and the second depressions are filled up with the material of the vertical alignment film formed on the first substrate.

25 13. A liquid crystal display device as claimed in claim 7, wherein the first depressions of the color filter layer are offset by a half of the predetermined pitch from the protrusions or slits of the second substrate.

14. A liquid crystal display device as claimed in claim 13, wherein pixel electrodes are formed on the second substrate, and the predetermined pitch is equal to an integral submultiple of an arrangement pitch of the pixel electrodes.

15. A liquid crystal display device as claimed in claim 7, wherein the first depressions of the color filter layer are bent in zigzag at intervals of a predetermined cycle, and the protrusions or slits provided on the second substrate are bent in zigzag at intervals of the predetermined cycle.

16. A method of manufacturing a liquid crystal display device comprising the steps of:

providing a first substrate and a second substrate;

10 forming a liquid crystal having a negative dielectric constant anisotropy between the first and second substrates;

forming color filters on the first substrate, each of the color filters having at least a first depression formed therein;

forming a common electrode on the color filters, the common electrode having a second depressions corresponding to the first depressions of the color filter layer;

forming photodefined spacers on the first substrate, the material of the spacers also filling into the second depressions of the common electrode, the material of the spacers having a dielectric constant smaller than the dielectric constant of the liquid crystal; and

forming a vertical alignment layer on each of the substrates.

20 17. The method as claimed in claim 16, wherein the filled second depressions have a substantially flat surface level with the surface of the first substrate.

18. The method as claimed in claim 16, the material of the spacers forms protrusions corresponding to the second depressions.

19. A method of manufacturing a liquid crystal display device comprising the steps of:

25 providing a first substrate and a second substrate;

forming a liquid crystal having a negative dielectric constant anisotropy between the first and second substrates;

forming color filters on the first substrate, each of the color filters having at least a first depression formed therein;

forming a common electrode on the color filters, the common electrode having a second depressions corresponding to the first depressions of the color filter layer; and

5 forming a vertical alignment film on each of the substrates, the material of the vertical alignment film also filling into the second depressions of the common electrode to obtain a substantially flat surface level with the surface of the first substrate, the material of the vertical alignment film having a dielectric constant smaller than the dielectric constant of the liquid crystal.